New Patent Document

10/664,983

with the

Requested Figures Added

Pierre Bourgoin

To: Ted Kim

From: Pierre Bourgon

Subject: refilling

First, I would like to apologize for comments in previous letters. If it's any consolation, this failure to realize the truth has caused me great grief and frustration. Ultimately a new test vehicle revealed the truth; the temperature gauge went the wrong way in my 1993 Ford Crown Victoria.

This new patent application the INTERNAL COMBUSTION ENGINE CATALYTIC COMVERTER replaces the INTERNAL COMBUSTION ENGINE CATALYTIC CONVERTER, US Application No. 09/643,654 August 21, 2000 because information published by the National Fuel Saver Company about the GASAVER, which was the basis for this design is incorrect. In fact, about 95% of the A/F Mixture does burn in a normal engine.

In this revision the Hagino reference will be dropped as all emissions related devices have been dropped. Although the INTERNAL COMBUSTION ENGINE CATALYTIC COMVERTER will do the emissions job, this is not the purpose of this device. The objective of this device is to ensure that as much of the energy in the fuel is converted into mechanical work fuel's energy as possible[1]. For example, Ford could with this device put the 3L OHV engine in a Crown Victoria and still maintain the same level of performance without forced induction. The engine would produce about 300ft/lb+/-10% of torque at about 2000rpm and about 220hp+/-10% at 5000rpm. Highway fuel consumption should be about 6L/100km or 39mpg. (US gallons)

Sincerely,

Pierre Bourgon

Pierre Bourgon

[1] See gasoline FAQs 1 to 4, section 10.2 @http://www.repairfaq.org/filipg/AUTO/F_Gasoline.html

Docket Number: Not assigned

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Application Number: 10/664,983
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I believe I am the original, first and sole inventor of the INTERNAL COMBUSTION ENGINE CATALYTIC CONVERTER for which a patent is sought. This application was filed on Friday, August 29, 2003 as a US Patent Application.

Sincerely,

Pierre Bourgon

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[54] TITLE: INTERNAL COMBUSTION ENGINE CATALYTIC CONVERTER

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ABSTRACT

In the Air Standard model for any Internal Combustion Engine it is assumed that the Air/Fuel Mixture combusts instantaneously and the thermal energy is delivered immediately. However in real world applications a certain amount of time is needed for the reactants to combust. Therefore, as the reactants combust more rapidly, the performance of the engine approaches the Air Standard Model. In an Internal Combustion Engine which burns petroleum based fuel, a catalytic coating of platinum in the combustion chamber will cause the A/F mixture to burn more rapidly and causing the flames speed to increase. This will increase the Internal Combustion Engine's Mean Effective Pressure (MEP). This rapid burning of the reactants (A/F mixture) brings Internal Combustion Engines closer to the Air Standard Otto Cycle, the Air Standard Diesel Cycle, and the Air Standard Duel Cycle in Piston Engines and the Air Standard Brayton Cycle in Gas Turbine Engines.

Because the catalyst actually lowers the activation energy of the reactants (Air/Fuel mixture) the incidents of Piston Engines "missing" and "flameout" in Gas Turbine Engines will be reduced.

In Spark Ignition Engines, because fuel will burn more rapidly the "unburned mixture" which can ignite and cause knocking will have less time to ignite before they are consumed by the flame front. Because of the increase in flame speed a greater percentage of the A/F will be converted into carbon dioxide and water, less "unburned mixture" will be left over from the exhaust stroke to cause knocking.

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Gasoline FAQ's 1 to 4, by: Bruce Hamilton
@http://www.repairfaq.org/filipg/AUTO/F_Gasoline.html, Wednesday, August 20, 2003

SPECIFICATIONS

BACKGROUND OF INVENTION

When I was about 7 my parents gave me a chemistry set for Christmas. I didn't really learn anything useful from it. This is because the people who made it didn't show any chemical equations, probably because they didn't think kid could understand them, ha! However, I became very proficient at using the lab equipment. Fast forward to high school, I understood what was happening much better than the other students, although my grades were less than praiseworthy because I was never book smart. This is where I learned what a catalyst and enzymes do. I also started working at a place called the Blue Beacon Truck Wash were I learned what a catalytic converter was and many facts about fuel efficiency. For example, a truck with an empty dry box trailer consumed as much fuel on the highway as a full one. Reducing the weight of the vehicle only effects city fuel efficiency. After college, one of the first designs I perused was the hybrid, but in laying out the basic design I realized that the basic design violated the LAW OF CONSERVATION OF ENERGY and THE FIRST, SECOND and THIRD LAW OF THERMAL DYNAMICS. Remembering that cars had catalytic converters, what they did and how they did it I concluded that a substantial amount of the air/fuel mixture must go through the engine without being burned. Having a 1988 Ford Thunderbird, I decided to test this theory. This vehicle had a MPFI 3.8L V6 and a 4speed overdrive transmission. It was first benchmarked the vehicle's fuel efficiency at 50km/h in the city and 110km/h on the highway.

With MacEwen's Ethanol:	12.5/23mpg (USg)	(lower energy content than gasoline)
With regular gas:	16/29mpg (USg)	(fuel designed for SFI engines)
Regular gas with Techron		(Detergents, fuel designed for
or fuel injector cleaner		MPFI engines, also good for SFI.)
or gas treatment:	19/34mpg (USg)	BENCHMARK
With aftermarket "PERK"		(additive: Atomizer and detergent)
pills mixed with fuel:	23/44mpg (USg)	(note: 8/29/03, temperature gauge
		dropped to lowest point above cold)

From the results of this test I concluded that massive fuel economy gains could be made through pure chemical engineering applications.

A couple years before, my father had purchased a device called the "GASAVER" for his 1979 Cadillac Broham D'Ellegance. It had a TBI 425 CI V8. My dad ordered a GASAVER I installed it. When I read the instruction I had found that the car had to be driven 200 to 2000km for this device to start working. Upon reading this I didn't think it would do anything, but is did. The car's average fuel efficiency increased from 12mpg to 17mpg.

Remembering this I concluded that what must happen is that the catalyst are deposited on the top of the pistons and in the combustion chamber in the head, this is why it would need to be run in. This is about the time when I was starting to find out the transmission in the T-Bird had seen better days and it was time to look for a different vehicle with less mileage. Also, the vehicle should be a mid size car with a 4 cylinder to offset the power gains caused by the increase in energy conversion efficiency. Less displacement would be required to effect an adequate power to weight ratio. The vehicle that was selected was a 1986 Oldsmobile Cutlass Cierra with a TBI 2.5L 4-cylinder engine and a 3-speed automatic with a locking torque converter clutch, which I originally thought was an overdrive gear. This engine was also chosen for it's reputation for being mechanically indestructible and it's reputation for overheating. Mechanical integrity was important because of the horsepower gain. Overheating was important because I wanted to see if and engine could withstand the higher combustion and operating temperatures. Basically this was a "lets see if it will break anything" car.

Adding the GASAVER increased the car's highway range from 400km to 550km on 50L of fuel at 110km/h. However, in the city it was a different story, the GASAVER can be washed out by excessive cold starts, WYNN'S gas treatment, Petro-Canada's Techron gasoline and PERK pills. If the car is run on the highway, however, the fuel economy gains follow through in the city. This also re-enforces the theory that catalytic deposits

collect on the top of the piston and the bottom combustion chamber in the heads. Adding an extra vile of platinum carrying additive made it work in the city. This also indicates the combustion chamber and top of the piston were coated. Finally when the GASAVER was removed after the second vile was added and run for 4000km and removed it still continued to work for another 500km. On the Cadillac I remember that the exhaust went from a smokey white to clear once the GASAVER was installed. For the first time water would run out of the exhaust when it was driven away hot. Just like a new car. It took 2 stages of exhaust mounted catalytic converters on the 99 Lincoln Town Car I saw do this. The Oldsmobile also did this after the GASAVER was installed.

The last parameter laid out was transparent conversion. There must be no loss of reliability. It is designed without compromise.

This is why platinum is specified as the catalyst to be used. This is why no mechanical modifications are specified. The catalytic coating must be inert, not susceptible to contamination from air, fuel or oil. It must also be resistant to the acids formed in the by-products of combustion, including nitric and sulfuric acid. If there is sulfur in the fuel, sulfuric acid will be present in the exhaust. If there are ever any Nitrous Oxide in the exhaust nitric acids will be formed. Eventually these acid compounds dissolve any thin coating that is not completely inert.

Choosing the catalyst

Ceramics can both be contaminated by fuel and oil and dissolved by acids. Eliminated. Nickel, Cobalt, Palladium are attacked by nitric and sulfuric acid. Eliminated. Iridium and Osmium oxidize when heated in air. Eliminated. Furthermore, from the chemistry books I had read and the information published by the National Fuel Saver Company Platinum was the obvious choice.

Platinum is not oxidized by air. Platinum cannot be contaminated by fuel or oil. Acids formed in the exhaust do not attack platinum. In fact platinum is used to make acid proof containers. BINGO! Reference data from MERCK INDEX, 9th Edition

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Me and a couple of my friends went to Beamsville Ontario for a couple of days before camp Omaph in the Toronto area for a weekend designed to help singles meet other eligible singles. This gave the GASAVER a chance to really shine because my car was driven on the highway consistently for a long distance. In the beginning the temperature gauge in the car would climb about 2/3 from the bottom to the top of the scale. If the National Fuel Saver Company's surmise that only 2/3rds of the air/fuel mixture burned in a normal engine than the temperature gauge should have climbed higher still. When I almost back home in Cornwall, I noticed that the temperature gauge had dropped to only 1/3 from bottom to the top. Two days later I realized there must be a great increase in thermal efficiency for the operating temperature to drop off so sharply. So I borrowed my friend's Fundamentals of Engineering Thermodynamic book to figure out what really was happening.

BUILDING THE INTERNAL COMBUSTION ENGINE CATALYTIC COMVERTER INTO AND ENGINE

All surfaces in an Internal Combustion Engine that will come in contact with a large proportion of the reactants (A/F mixture) as it passes through the engine will be coated with the elemental metallic catalyst Platinum. The thickness of the coating should be 10nm to 1um thick. It should be attached by electro-plating or anodization.

In piston engines the top of the piston (see FIGURE#1) and the combustion chamber should be coated. For the purpose of this design combustion chamber entails the entire area on the bottom of the cylinder head, which is above the piston. (see FIGURE#2) In engines with more than two valves per cylinder the bottom of the valves should also be plated with Platinum. See pictures of Performer LT1 Head # 61909 and the picture of the engine block that shows the area on the top of pistons that should be electroplated of anodized.

In gas turbine engines the combustion chamber (can, flame holder, combustor; see FIGURE#3) and the turbines (exhaust fans, see FIGURE#4) should be plated with Platinum. See pictures of Turbine/Compressor assembly and the Flame Holder or "Can".